

# SEQUENCE LISTING

<110> Mahajan, Pramod  
Zuo, Zhuang

<120> Poly ADP-Ribose Polymerase Gene and its  
Uses

<130> 5718-34

<140> US 09/236,995  
<141> 1999-01-26

<150> US 60/072,785  
<151> 1998-01-27

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<170> FastSEQ for Windows Version 4.0

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<221> misc\_feature  
<222> 1584, 1588, 2078, 2107  
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Arg Ala Ser Cys Lys Ser Cys Arg Ser Pro Ile Ala Lys Asp Gln Leu	
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cgt ctt ggc aag atg gtt cag gcg tca cag ttc gac ggc ttc atg ccg	144
Arg Leu Gly Lys Met Val Gln Ala Ser Gln Phe Asp Gly Phe Met Pro	
35 40 45	
atg tgg aac cat gcc agg tgc atc ttc agc aag aag aac cag ata aaa	192
Met Trp Asn His Ala Arg Cys Ile Phe Ser Lys Lys Asn Gln Ile Lys	
50 55 60	
tcc gtt gac gat gtt gaa ggg ata gat gca ctt aga tgg gat gat caa	240
Ser Val Asp Asp Val Glu Gly Ile Asp Ala Leu Arg Trp Asp Asp Gln	
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gag aag ata cga aac tac gtt ggg agt gcc tca gct ggt aca agt tct	288

Glu	Lys	Ile	Arg	Asn	Tyr	Val	Gly	Ser	Ala	Ser	Ala	Gly	Thr	Ser	Ser		
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aca	gct	gct	cct	cct	gag	aaa	tgt	aca	att	gag	att	gct	cca	tct	gcc	336	
Thr	Ala	Ala	Pro	Pro	Glu	Lys	Cys	Thr	Ile	Glu	Ile	Ala	Pro	Ser	Ala		
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cgt	act	tca	tgt	aga	cga	tgc	agt	gaa	aag	att	aca	aaa	gga	tcg	gtc	384	
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cgt	ctt	tca	gct	aag	ctt	gag	agt	gaa	ggg	ccc	aag	ggg	ata	cca	tgg	432	
Arg	Leu	Ser	Ala	Lys	Leu	Glu	Ser	Glu	Gly	Pro	Lys	Gly	Ile	Pro	Trp		
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tat	cat	gcc	aac	tgt	ttc	ttt	gag	gta	tcc	ccg	tct	gca	act	gtt	gag	480	
Tyr	His	Ala	Asn	Cys	Phe	Phe	Glu	Val	Ser	Pro	Ser	Ala	Thr	Val	Glu		
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aag	ttc	tca	ggc	tggt	gat	act	ttg	tcc	gat	gag	gat	aag	aga	acc	atg	528	
Lys	Phe	Ser	Gly	Trp	Asp	Thr	Leu	Ser	Asp	Glu	Asp	Lys	Arg	Thr	Met		
				165					170					175			
ctc	gat	ctt	gtt	aaa	aaa	gat	gtt	ggc	aac	aat	gaa	caa	aat	aag	ggg	576	
Leu	Asp	Leu	Val	Lys	Lys	Asp	Val	Gly	Asn	Asn	Glu	Gln	Asn	Lys	Gly		
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tcc	aag	cgc	aag	aaa	agt	gaa	aat	gat	att	gat	agc	tac	aaa	tcc	gcc	624	
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Arg	Leu	Asp	Glu	Ser	Thr	Ser	Glu	Gly	Thr	Val	Arg	Asn	Lys	Gly	Gln		
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Leu	Val	Asp	Pro	Arg	Gly	Ser	Asn	Thr	Ser	Ser	Ala	Asp	Ile	Gln	Leu		
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Lys	Leu	Lys	Glu	Gln	Ser	Asp	Thr	Leu	Trp	Lys	Leu	Lys	Asp	Gly	Leu		
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Lys	Thr	His	Val	Ser	Ala	Ala	Glu	Leu	Arg	Asp	Met	Leu	Glu	Ala	Asn		
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ggg	cag	gat	aca	tca	gga	cca	gaa	agg	cac	cta	ttg	gat	cgc	tgt	gcg	864	
Gly	Gln	Asp	Thr	Ser	Gly	Pro	Glu	Arg	His	Leu	Leu	Asp	Arg	Cys	Ala		
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gat	gga	atg	cta	ttt	gga	gcg	ctg	ggg	cct	tgc	cca	gtc	tgt	gct	aat	912	
Asp	Gly	Met	Leu	Phe	Gly	Ala	Leu	Gly	Pro	Cys	Pro	Val	Cys	Ala	Asn		
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ggc	atg	tac	tat	tat	aat	ggg	cag	tac	caa	tgc	agt	ggg	aat	gtg	tca	960	

Gly Met Tyr Tyr Tyr Asn Gly Gln Tyr Gln Cys Ser Gly Asn Val Ser	
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gag tgg tcc aag tgt aca tac tct gcc aca gaa cct gtc cgc gtt aag	1008
Glu Trp Ser Lys Cys Thr Tyr Ser Ala Thr Glu Pro Val Arg Val Lys	
325 330 335	
aag aag tgg caa att cca cat gga aca aag aat gat tac ctt atg aag	1056
Lys Lys Trp Gln Ile Pro His Gly Thr Lys Asn Asp Tyr Leu Met Lys	
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tgg ttc aaa tct caa aag gtt aag aaa cca gag agg gtt ctt cca cca	1104
Trp Phe Lys Ser Gln Lys Val Lys Lys Pro Glu Arg Val Leu Pro Pro	
355 360 365	
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Met Ser Pro Glu Lys Ser Gly Ser Lys Ala Thr Gln Arg Thr Ser Leu	
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Leu Ser Ser Lys Gly Leu Asp Lys Leu Arg Phe Ser Val Val Gly Gln	
385 390 395 400	
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Ser Lys Glu Ala Ala Asn Glu Trp Ile Glu Lys Leu Lys Leu Ala Gly	
405 410 415	
gcc aac ttc tat gcc agg gtt gtc aaa gat att gat tgt tta att gca	1296
Ala Asn Phe Tyr Ala Arg Val Val Lys Asp Ile Asp Cys Leu Ile Ala	
420 425 430	
tgt ggt gag ctc gac aat gaa aat gct gaa gtc agg aaa gca agg agg	1344
Cys Gly Glu Leu Asp Asn Glu Asn Ala Glu Val Arg Lys Ala Arg Arg	
435 440 445	
ctg aag ata cca att gta agg gag ggt tac att gga gaa tgt gtt aaa	1392
Leu Lys Ile Pro Ile Val Arg Glu Gly Tyr Ile Gly Glu Cys Val Lys	
450 455 460	
aga aca aaa tgc tgc cat ttg att tgt ata aac tgg aat gcc tta gag	1440
Arg Thr Lys Cys Cys His Leu Ile Cys Ile Asn Trp Asn Ala Leu Glu	
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tcc tca aaa ggc mgt act gtc act gtt aaa gtt aag ggc cga agt gct	1488
Ser Ser Lys Gly Xaa Thr Val Thr Val Lys Val Lys Gly Arg Ser Ala	
485 490 495	
tgt tca tya agt cct cyg gtt tgc aag aat act gct cac att cct tra	1536
Cys Ser Xaa Ser Pro Xaa Val Cys Lys Asn Thr Ala His Ile Pro Xaa	
500 505 510	
gra tgg gaa aag cat ata caa tgc amc ctt aaa cat gtt ctg acc tgn	1584
Xaa Trp Glu Lys His Ile Gln Cys Xaa Leu Lys His Val Leu Thr Xaa	
515 520 525	
cac nag gtg tgy aca ggc tac tat gta ctc cag atc att gaa cag gat	1632

His	Xaa	Val	Cys	Thr	Gly	Tyr	Tyr	Val	Leu	Gln	Ile	Ile	Glu	Gln	Asp		
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Asp	Gly	Ser	Glu	Cys	Tyr	Val	Phe	Arg	Lys	Trp	Gly	Arg	Val	Gly	Ser		
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Glu	Lys	Ile	Gly	Gly	Gln	Lys	Leu	Glu	Glu	Met	Ser	Lys	Thr	Glu	Ala		
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Ile	Lys	Glu	Phe	Lys	Arg	Leu	Phe	Leu	Glu	Lys	Thr	Gly	Asn	Ser	Trp		
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Glu	Ala	Trp	Glu	Cys	Lys	Thr	Asn	Phe	Arg	Lys	Gln	Pro	Gly	Arg	Phe		
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Tyr	Pro	Leu	Asp	Val	Asp	Tyr	Gly	Val	Lys	Lys	Ala	Pro	Lys	Arg	Lys		
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Phe	Glu	Xaa	Asn	Met	Ser	Glu	Met	Pro	Leu	Gly	Lys	Leu	Ser	Xaa	Xaa		
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Leu	Xaa	Xaa	Xaa	Xaa	Xaa	Phe	Ser	Leu	Leu	Ser	Leu	Leu	Phe	Ile	Leu		
705					710				715						720		
ata	tta	tac	ggg	atg	agg	atg	att	tca	tat	tca	aag	gcg	aaa	atg	ctt	2208	
Ile	Leu	Tyr	Gly	Met	Arg	Met	Ile	Ser	Tyr	Ser	Lys	Ala	Lys	Met	Leu		
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gaa	gct	ctg	cag	gat	att	gaa	att	gct	tca	aag	ata	gtt	ggc	ttc	gat	2256	
Glu	Ala	Leu	Gln	Asp	Ile	Glu	Ile	Ala	Ser	Lys	Ile	Val	Gly	Phe	Asp		
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Ser	Asp	Ser	Asp	Glu	Ser	Leu	Asp	Asp	Lys	Tyr	Met	Lys	Leu	His	Cys		
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gac	atc	acc	ccg	ctg	gct	cac	gat	agt	gaa	gat	tac	aag	tta	att	gag	2352	
Asp	Ile	Thr	Pro	Leu	Ala	His	Asp	Ser	Glu	Asp	Tyr	Lys	Leu	Ile	Glu		
	770					775					780						
cag	tat	ctc	ctc	aac	aca	cat	gct	cct	act	cac	aag	gac	tgg	tcg	ctg	2400	
Gln	Tyr	Leu	Leu	Asn	Thr	His	Ala	Pro	Thr	His	Lys	Asp	Trp	Ser	Leu		
785					790					795					800		
gaa	ctg	gag	gaa	gtt	ttt	tca	ctt	gat	cga	gat	gga	gaa	ctt	aat	aag	2448	
Glu	Leu	Glu	Glu	Val	Phe	Ser	Leu	Asp	Arg	Asp	Gly	Glu	Leu	Asn	Lys		
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tac	tca	aga	tat	aaa	aat	aat	ctg	cat	aac	aag	atg	cta	tta	tgg	cac	2496	
Tyr	Ser	Arg	Tyr	Lys	Asn	Asn	Leu	His	Asn	Lys	Met	Leu	Leu	Trp	His		
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ggc	tca	agg	ttg	acg	aat	ttt	gtg	gga	att	ctt	agt	caa	ggg	cta	aga	2544	
Gly	Ser	Arg	Leu	Thr	Asn	Phe	Val	Gly	Ile	Leu	Ser	Gln	Gly	Leu	Arg		
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att	gca	cct	cct	gag	gca	cct	gtt	act	ggc	tat	atg	ttc	ggc	aaa	ggc	2592	
Ile	Ala	Pro	Pro	Glu	Ala	Pro	Val	Thr	Gly	Tyr	Met	Phe	Gly	Lys	Gly		
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gat	agg	aat	aat	cct	gta	ggc	ttg	atg	ctt	ctt	tct	gag	gtt	gct	tta	2688	
Asp	Arg	Asn	Asn	Pro	Val	Gly	Leu	Met	Leu	Leu	Ser	Glu	Val	Ala	Leu		
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gga	gac	atg	tat	gaa	cta	aag	aaa	gcc	acg	tcc	atg	gac	aaa	cct	cca	2736	
Gly	Asp	Met	Tyr	Glu	Leu	Lys	Lys	Ala	Thr	Ser	Met	Asp	Lys	Pro	Pro		
			900					905					910				
aga	ggg	aag	cat	tcg	acc	aag	gga	tta	ggc	aaa	acc	gtg	cca	ctg	gag	2784	
Arg	Gly	Lys	His	Ser	Thr	Lys	Gly	Leu	Gly	Lys	Thr	Val	Pro	Leu	Glu		
		915					920					925					
tca	gag	ttt	gtg	aag	tgg	agg	gat	gat	gtc	gta	gtt	ccc	tgc	ggc	aag	2832	
Ser	Glu	Phe	Val	Lys	Trp	Arg	Asp	Asp	Val	Val	Val	Pro	Cys	Gly	Lys		
	930					935					940						
ccg	gtg	cca	tca	tca	att	agg	agc	tct	gaa	ctc	atg	tac	aat	gag	tac	2880	
Pro	Val	Pro	Ser	Ser	Ile	Arg	Ser	Ser	Glu	Leu	Met	Tyr	Asn	Glu	Tyr		
945					950					955					960		
atc	gtc	tac	aac	aca	tcc	cag	gtg	aag	atg	cag	ttc	ttg	ctg	aag	gtg	2928	
Ile	Val	Tyr	Asn	Thr	Ser	Gln	Val	Lys	Met	Gln	Phe	Leu	Leu	Lys	Val		
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Arg Phe His His Lys Arg \*  
980

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35 40 45  
Met Trp Asn His Ala Arg Cys Ile Phe Ser Lys Lys Asn Gln Ile Lys  
50 55 60  
Ser Val Asp Asp Val Glu Gly Ile Asp Ala Leu Arg Trp Asp Asp Gln  
65 70 75 80  
Glu Lys Ile Arg Asn Tyr Val Gly Ser Ala Ser Ala Gly Thr Ser Ser  
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Thr Ala Ala Pro Pro Glu Lys Cys Thr Ile Glu Ile Ala Pro Ser Ala  
100 105 110  
Arg Thr Ser Cys Arg Arg Cys Ser Glu Lys Ile Thr Lys Gly Ser Val  
115 120 125  
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130 135 140  
Tyr His Ala Asn Cys Phe Phe Glu Val Ser Pro Ser Ala Thr Val Glu  
145 150 155 160  
Lys Phe Ser Gly Trp Asp Thr Leu Ser Asp Glu Asp Lys Arg Thr Met  
165 170 175  
Leu Asp Leu Val Lys Lys Asp Val Gly Asn Asn Glu Gln Asn Lys Gly  
180 185 190  
Ser Lys Arg Lys Lys Ser Glu Asn Asp Ile Asp Ser Tyr Lys Ser Ala  
195 200 205  
Arg Leu Asp Glu Ser Thr Ser Glu Gly Thr Val Arg Asn Lys Gly Gln  
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225 230 235 240  
Lys Leu Lys Glu Gln Ser Asp Thr Leu Trp Lys Leu Lys Asp Gly Leu  
245 250 255  
Lys Thr His Val Ser Ala Ala Glu Leu Arg Asp Met Leu Glu Ala Asn  
260 265 270  
Gly Gln Asp Thr Ser Gly Pro Glu Arg His Leu Leu Asp Arg Cys Ala  
275 280 285  
Asp Gly Met Leu Phe Gly Ala Leu Gly Pro Cys Pro Val Cys Ala Asn  
290 295 300  
Gly Met Tyr Tyr Tyr Asn Gly Gln Tyr Gln Cys Ser Gly Asn Val Ser  
305 310 315 320

Glu	Trp	Ser	Lys	Cys	Thr	Tyr	Ser	Ala	Thr	Glu	Pro	Val	Arg	Val	Lys	
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Lys	Lys	Trp	Gln	Ile	Pro	His	Gly	Thr	Lys	Asn	Asp	Tyr	Leu	Met	Lys	
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Trp	Phe	Lys	Ser	Gln	Lys	Val	Lys	Lys	Pro	Glu	Arg	Val	Leu	Pro	Pro	
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Leu	Ser	Ser	Lys	Gly	Leu	Asp	Lys	Leu	Arg	Phe	Ser	Val	Val	Gly	Gln	
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Ser	Lys	Glu	Ala	Ala	Asn	Glu	Trp	Ile	Glu	Lys	Leu	Lys	Leu	Ala	Gly	
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Ala	Asn	Phe	Tyr	Ala	Arg	Val	Val	Lys	Asp	Ile	Asp	Cys	Leu	Ile	Ala	
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Cys	Gly	Glu	Leu	Asp	Asn	Glu	Asn	Ala	Glu	Val	Arg	Lys	Ala	Arg	Arg	
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Cys	Ser	Xaa	Ser	Pro	Xaa	Val	Cys	Lys	Asn	Thr	Ala	His	Ile	Pro	Xaa	
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	515					520						525				
His	Xaa	Val	Cys	Thr	Gly	Tyr	Tyr	Val	Leu	Gln	Ile	Ile	Glu	Gln	Asp	
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Asp	Gly	Ser	Glu	Cys	Tyr	Val	Phe	Arg	Lys	Trp	Gly	Arg	Val	Gly	Ser	
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Glu	Lys	Ile	Gly	Gly	Gln	Lys	Leu	Glu	Glu	Met	Ser	Lys	Thr	Glu	Ala	
			565					570						575		
Ile	Lys	Glu	Phe	Lys	Arg	Leu	Phe	Leu	Glu	Lys	Thr	Gly	Asn	Ser	Trp	
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Glu	Ala	Trp	Glu	Cys	Lys	Thr	Asn	Phe	Arg	Lys	Gln	Pro	Gly	Arg	Phe	
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Tyr	Pro	Leu	Asp	Val	Asp	Tyr	Gly	Val	Lys	Lys	Ala	Pro	Lys	Arg	Lys	
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Phe	Glu	Xaa	Asn	Met	Ser	Glu	Met	Pro	Leu	Gly	Lys	Leu	Ser	Xaa	Xaa	
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	675					680						685				
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	690					695					700					
Leu	Xaa	Xaa	Xaa	Xaa	Xaa	Phe	Ser	Leu	Leu	Ser	Leu	Leu	Phe	Ile	Leu	
705					710				715						720	
Ile	Leu	Tyr	Gly	Met	Arg	Met	Ile	Ser	Tyr	Ser	Lys	Ala	Lys	Met	Leu	
			725					730						735		
Glu	Ala	Leu	Gln	Asp	Ile	Glu	Ile	Ala	Ser	Lys	Ile	Val	Gly	Phe	Asp	
		740					745						750			
Ser	Asp	Ser	Asp	Glu	Ser	Leu	Asp	Lys	Tyr	Met	Lys	Leu	His	Cys		
		755					760					765				

Asp Ile Thr Pro Leu Ala His Asp Ser Glu Asp Tyr Lys Leu Ile Glu  
 770 775 780  
 Gln Tyr Leu Leu Asn Thr His Ala Pro Thr His Lys Asp Trp Ser Leu  
 785 790 795 800  
 Glu Leu Glu Glu Val Phe Ser Leu Asp Arg Asp Gly Glu Leu Asn Lys  
 805 810 815  
 Tyr Ser Arg Tyr Lys Asn Asn Leu His Asn Lys Met Leu Leu Trp His  
 820 825 830  
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